

## REMARKS

### STATUS OF THE CLAIMS

Claims 1-22 remain in the application.

The Office rejected Claims 1-22 under 35 U.S.C. 103(a) as being unpatentable over *Moyer* in view of *Manginell*.

### SUMMARY OF THE INVENTION

The present invention is directed to a non-planar chemical preconcentrator comprising a high-surface area, low mass, three-dimensional, flow-through sorption support structure that can be coated or packed with a sorptive material. The sorptive material can collect and concentrate a chemical analyte from a fluid stream and rapidly release it as a very narrow temporal plug for improved separations in a microanalytical system.

### SUMMARY OF THE ART

*Moyer et al.*, U.S. 5,194,154, discloses a cross-flow structure useful for filtering a fluid, for exchanging one or more constituents between two fluids, or for exchanging heat between two fluids. The structure includes a body having porous partition walls defining at least one open channel extending entirely through it. The body is composed of fused, interlocked, single crystal acicular ceramic material.

*Manginell et al.*, U.S. 6,171,378, discloses a planar chemical preconcentrator wherein a sorptive material is coated on a suspended membrane. The sorptive coating can selectively sorb one or more chemical species of interest over a time period. The suspended membrane can be rapidly heated by a proximate heating element to rapidly release the sorbed chemical species for detection and analysis.

## ARGUMENTS

### CLAIMS 1-22, LIMITED TO A SORPTION SUPPORT STRUCTURE, ARE NOT MADE OBVIOUS BY MOYER IN VIEW OF MANGINELL

The Office rejected Claims 1-22, asserting that the Applicants' non-planar chemical preconcentrator is made obvious by *Moyer*'s cross-flow structure useful for filtering a

fluid, in view of *Manginell*'s planar chemical preconcentrator. To establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations, there must be some suggestion or motivation to modify or combine the reference teachings, and there must be some reasonable expectation of success. *See* MPEP 2143.

All claim limitations must be taught or suggested by the prior art. *See* MPEP 2143.03. *Moyer* teaches a filter comprising a membrane 26 and a porous discriminating layer 28 capable of exchanging constituents between counter-flowing fluid streams. *See Moyer*, col. 6, lines 34-42; col. 8, lines 47-61; and FIG. 5. The membrane/layer 26, 28 separates constituents between fluid streams 40, depending on their size. *See Moyer*, col. 9, lines 12-23; col. 9, lines 38-5; and FIG. 5. *Manginell* teaches a sorptive material 18 formed on a planar suspended membrane 14. *See Manginell*, col. 4, lines 34-49, and FIG. 1b. Neither *Moyer* nor *Manginell* teach or suggest a sorptive material disposed on a sorptive support structure to sorb and concentrate a chemical species of interest from a fluid sample, as recited in Applicants' claim 1. *See Application*, page 6, lines 1-8, and claim 1.

Obviousness can only be established by combining or modifying teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *See* MPEP 2143.01. The burden is on the Office to explain why the combination of the teachings is proper. The Office provides no objective evidence or specific factual findings in the references as to why a person would be specifically motivated to combine *Moyer* and *Manginell* to achieve Applicants' non-planar preconcentrator. The Office merely states that "it should have been obvious to one of ordinary skill in the art to modify the system of *Moyer* such that at least one resistive heating element is disposed on the surface of the membrane as exactly taught by *Manginell* in order to achieve optimal filtration conditions of the filter." As argued above, *Moyer*'s filter performs a different function from Applicants' chemical preconcentrator. Further, there is no objective evidence or specific factual findings in either *Moyer* or *Manginell* that temperature, as provided by *Manginell*'s resistive heating element, has any effect whatsoever on *Moyer*'s filtration conditions.

Further, there must be some reasonable expectation of success. *See* MPEP 2143.02. *Moyer*'s cross-flow structure is clearly a large, macroscale device. There is no teaching or suggestion that *Moyer*'s body 11 is a thin-film membrane, made from semiconductor materials, that has high thermal efficiency and low heat capacity, as required for Applicants' rapid thermal desorption of a sorbed chemical analyte. *See* Application, page 3, lines 8-21, and claim 1. Further, there is no teaching or suggestion in *Moyer* or *Manginell* that *Manginell*'s thin-film resistive heating element could provide rapid heating of *Moyer*'s body 11, as required by Applicants' non-planar preconcentrator. *See* Application, page 14, lines 1-14. Therefore, there is no reasonable expectation that combining *Moyer*'s large body with *Manginell*'s thin-film resistive heating element would provide rapid heating of *Moyer*'s body or rapid thermal desorption of any sorbed chemical analyte.

Furthermore, *Moyer* is nonanalogous art and cannot be relied on for an obviousness rejection. *Moyer* relates to a cross-flow structure that can be used for filtering, or exchanging constituents or heat between fluid streams. Therefore, *Moyer* is neither in the field of Applicants' endeavor (chemical analysis) nor reasonably pertinent to the particular problem with which the inventor is concerned (chemical preconcentration). Nor is there any reference in *Moyer* to either chemical analysis or chemical preconcentration. *See* MPEP 2141.01(a).

Applicants submit that the Office has not established a *prima facie* case of obviousness. Accordingly, Applicants submit that this rejection is overcome and that Claim 1 is in condition for allowance. Furthermore, Applicants submit that Claims 2-22, which depend from and further define Claim 1, are likewise in condition for allowance. *See* MPEP 2143.03.

**CONCLUSION**

Applicants urge that the application is now in condition for allowance.

Respectfully submitted,



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**CERTIFICATION UNDER 37 CFR 1.8**

I hereby certify that this correspondence and documents referred to herein were deposited with the United States Postal Service as first class mail addressed to: Commissioner for Patents, Alexandria, VA 22313-1450 on the date shown below.

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